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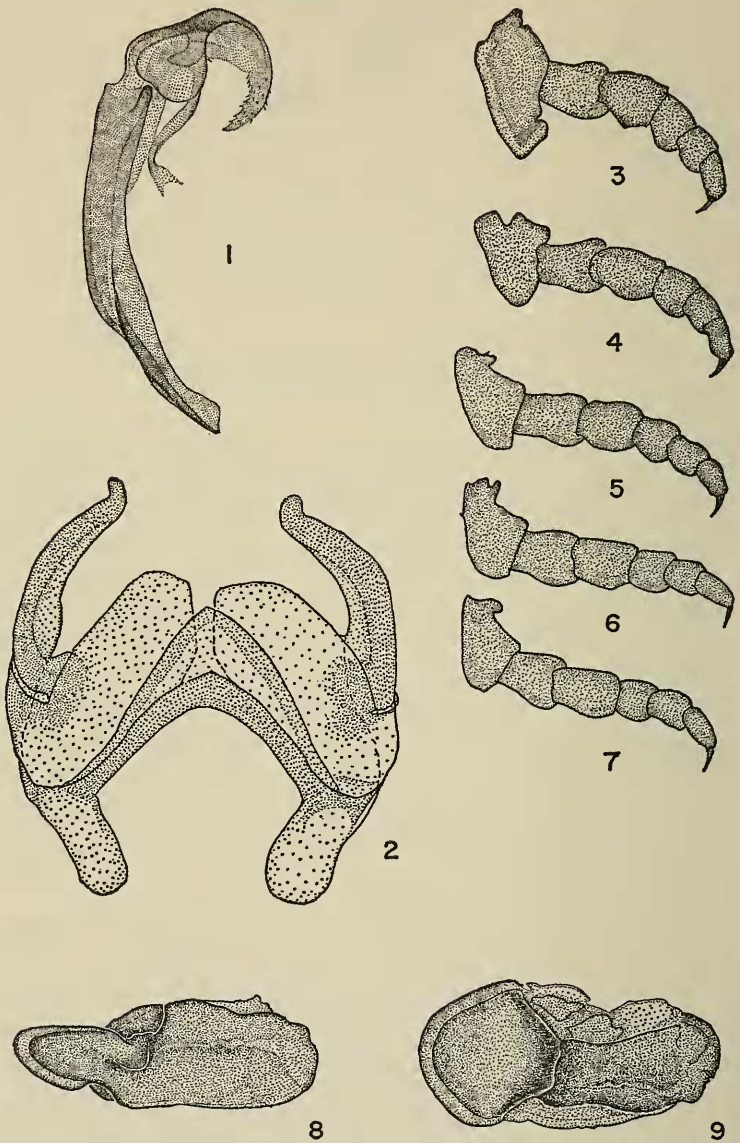
PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON

REDISCOVERY AND REDESCRIPTION OF
TYLOBOLUS DESES COOK, WITH THE
DESCRIPTION OF A NEW SUBSPECIES
(DIPLOPODA : SPIROBOLIDAE)

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In December, 1961, a series of ten specimens of *Tylobolus deses* Cook was collected four miles southeast of Petaluma, Sonoma County, California. These specimens were collected beneath old logs of the California Laurel (*Umbellularia californica* Nutt.). The logs were scattered scantily throughout an Oak-Laurel woodland. In the winter of 1964-65, additional specimens of *deses* were collected at various localities in greater central California. These specimens were collected in much the same habitat as the Sonoma County specimens, except for specimens collected in the vicinity of Cordelia, California, which were collected beneath litter composed primarily of the Big Leaf Maple (*Acer macrophyllum* Pursh.), and the Coast Live Oak (*Quercus agrifolia* Neé). With close examination it was found that the specimens collected represented two significantly different subspecies.

To date, no specimens other than those of the type series have been positively identified as *deses* (except for a listing by Buckett, 1964). Thus, the specimens used in this work are the only specimens known in addition to the type series. The Sonoma County specimens cited by Buckett (*op. cit.*) are used in the present work. The only locality data available for the type series of *deses* is "California." Due to the limited locality data available, one cannot accurately evaluate the range of this species. It seems probable that *deses deses* may be restricted to the outer coast ranges of central California, whereas *deses magnificus* Buckett and Gardner, new sub-



FIGS. 1-9, *Tylobolus deses deses*. 1—right posterior gonopod of male, caudal view; 2—anterior gonopods of male, cephalic view; 3-7—caudal views of right pregenital legs of male, legs 3-7, respectively; 8—right cyphopod of female, lateral view; 9—right cyphopod, caudal view.

species, may inhabit only the inner coast ranges of central California.

The 15 specimens composing the type series of *deses deses* were collected by Mr. Carl F. Baker, probably in the vicinity of Palo Alto (teste Cook). Chamberlin (1949) stated for the type-locality: "California: Exact locality not known, but probably either the vicinity of Stanford University or of Claremont." Chamberlin does not indicate where he obtained this information. There is reason to believe that the former is the more probable type-locality as is evidenced by the recent collection of a mature male from Stanford University, in San Mateo County.

Both the gonopods of the male and the cyphopods of the female were dissected, cleared in potassium hydroxide, and stained with lignin pink. The illustrations were prepared by aid of a bioscope, and corrections made by use of a dissecting microscope.

Tylobolus deses deses Cook

Tylobolus deses Cook, 1904. In Harriman Alaska Expedition, 8: 65, pl. 3, Figs. 3 a-h.

Tylobolus deses, Chamberlin, 1949. J. Wash. Acad. Sci., 39: 168.

Tylobolus deses, Chamberlin and Hoffman, 1958. Bull. U. S. Nat. Mus., no. 212, p. 168.

Tylobolus deses, Keeton, 1960. Mem. Amer. Entomol. Soc., no. 17, p. 126.

Tylobolus deses, Buckett, 1964. Simmons Publ. Co., Davis, p. 24.

Males: Total length 44-64 mm (53.5 mm); width 4.0-6.6 mm (5.7 mm); length/width ratio 8.5-11.0 (9.5); number of segments from 42-51 (46); simple eyes per patch 28-36 (30); eye patches separated by $3.5 \times$ width of eye patch; clypeal setae per specimen 8-11 (9.5); labral setae per specimen 12-15 (13.5); stipital setae of gnathochilarium 10-16 (13.1). Collum extending cephalad to eyes, but not covering them; mandibular cheeks and antennal groove also exposed; anterior edge of collum sometimes curving smoothly ventrad, sometimes curving caudad at eyes then ventrad at one half the length of the mandibular cheek. Tergites with numerous striae, reaching to repugnatorial pore on mid-belts, and three-fourths the way between coxae and repugnatorial pore on hind belts. Second segment extending far below ends of collum, heavily sclerotized ventrally, anterior edge sometimes exceeding ventral tip of collum, ventral edge usually curving smoothly posterodorsally, but sometimes produced anteriorly into a laterally flattened lobe. Claw of leg 1 shorter than distal podomere; third pair of legs with coxae greatly

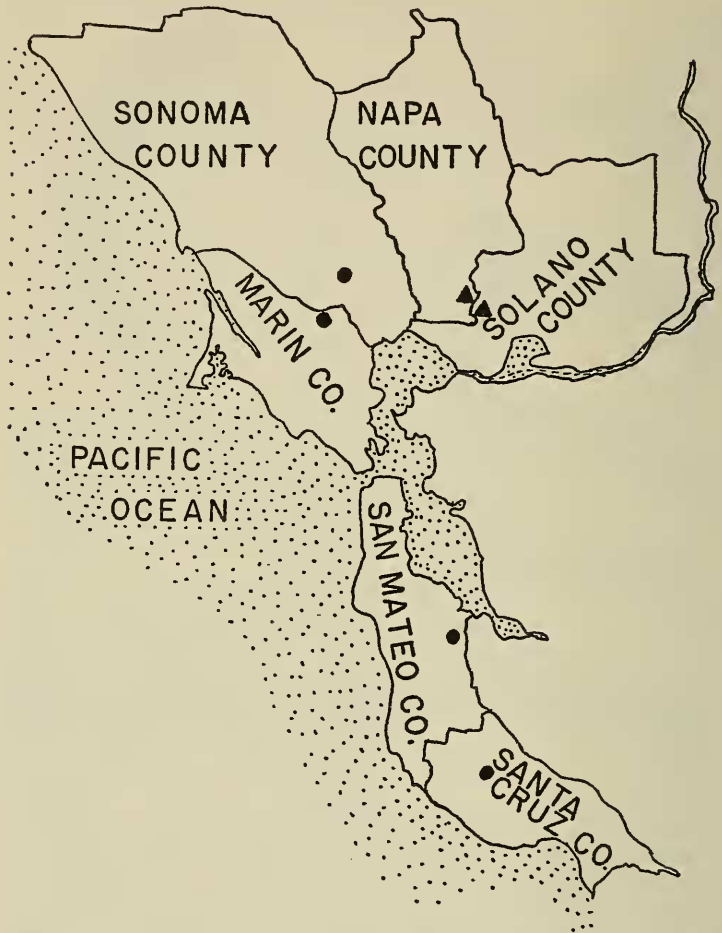


FIG. 10. Distribution of *Tylobolus deses deses* (dots), and *T. deses magnificentus* (triangles) in central California.

produced posteriorly, broadly rounded anterolaterally, narrowing posteriorly to vertical ridge, lateroventral surface flattened, a carina ventromesally; coxa of leg 4 rounded laterally, narrowing mesally to vertical ridge; leg 5 with coxa a narrow transverse ridge (narrower than leg 4), slightly broader laterally than mesally, and curving smoothly mesodorsally; legs 5 and 6 with coxae as broadly rounded longitudinally as transversely; podomeres of all legs exhibiting no noticeable lobular processes. Anterior gonopods with distinctly distally uncinatate telopodites; coxal endites greatly exceeding apex of sternum mesally, smoothly arching

laterally; posterior gonopods with very long, greatly curved distal process, process spinose nearly to apex; wall of seminal receptacle evenly curved. Anal lips distinct.

Females: Total length 67–70 mm (69 mm); width 8.0–8.6 mm (8.3 mm); length/width ratio 8.1–8.5 (8.3); number of segments from 44–46 (45); simple eyes per patch 32–35 (33.5); eye patches separated by $3.5 \times$ width of eye patch; clypeal setae per specimen 8–11 (9.3); labral setae per specimen 13–14 (13.3); stipital setae of gnathochilarium 12–18 (14.3); remainder of female, except cyphopods, as in male. Cyphopods with basal portion prominently raised; lateral flange much lower than either basal portion or distal lobe when viewed from caudal plane; distal lobe evenly rounded, rising abruptly where it contacts basal portion. Cyphopods as in figures 8 and 9.

T. deses deses is apparently most closely related to *T. castaneus* Chamberlin, as is evidenced most prominently by both the anterior and posterior gonopods of the male. However, if one is to consider the non-swollen podomeres of the pregenital and postgenital legs and the spining of the distal process of the posterior gonopods, *deses* appears to be most closely related to *T. claremontus* Chamberlin. In his original description, Cook compares *deses* with *Hiltonius hebes* (Bollman), which is far removed from *deses*, as we know speciation in the Tylobolinae today.

As can be seen by the illustration of the anterior gonopod, the telopodites distally are distinctly uncinata. Until now, the only complete illustration of the anterior gonopods was presented by Cook (1904) in the Harriman Alaska Expedition. Unfortunately, the data pertaining to *deses*, which is on plate 4, precedes plate 3, and is labeled "plate III," whereas, data for plate 3 precedes plate 4. Apart from this slight bit of confusion Cook's illustration is passable. Keeton (1960) apparently overlooked this error in Cook's work, and thus erroneously cites pl. 3, 3 a–h rather than pl. 4, as it actually should be. The sketch (Fig. 223) of a female cyphopod of one of Keeton's unidentified *Tylobolus* spp. seems to correspond quite well with *deses*.

Male *magnificus* ssp. nov. differ significantly from male *deses* in many characteristics. Student's T Distribution at the 5% level of significance shows that *magnificus* ssp. nov. is longer and wider than the nominate *deses*, possesses more segments, eyes per patch, labral setae, and stipital setae of the gnathochilarium. For exact numerical evaluation, see Table 1. The authors possess only three female specimens of the nominate *deses*; therefore, meaningful statistical analysis of interpopulational differences could not be carried out for that sex.

***Tylobolus deses magnificus* Buckett and Gardner, new subspecies**

Holotype male: Total length 65 mm; width 7.3 mm; length/width ratio 8.9; total number of segments 47; eyes 38 right + 41 left; clypeal setae 10; labral setae 15; stipital setae of gnathochilarium 18; collum extending cephalad to eyes but not covering them; mandibular cheeks

and antennal groove exposed; anterior edge of collum curving caudad at eyes, then ventrad at one-half the length of mandibular cheek; tergites with numerous striae, reaching to repugnatorial pore on mid-belts, and three-fourths the way between coxae and repugnatorial pore on hind belts; second segment heavily sclerotized ventrally, anterior margin extending ventrad from, and far exceeding apex of collum; claws shorter than adjoining distal podomere; legs 3 and 4 with podomeres 1 and 2 slightly lobed; legs otherwise as in the nominate *deses*. Gonopods similar to the nominate *deses*; anal lips less distinct than in the nominate *deses*.

Allotype female: Total length 75 mm; width 8.4 mm; length/width ratio 8.6; total number of segments 46; eyes 33 right + 36 left; clypeal setae 9; labral setae 14; stipital setae of gnathochilarium 14. Much larger and lighter in coloration than male. For range of variation in this sex, see Table 1.

TABLE 1. Data for *T. deses deses* (A); data for *T. deses magnificus* (B); 95% confidence limits for mean of population, based on mean of sample and size of sample (CLM); number of clypeal setae per specimen (CS); number of eyes per patch (E/P); length of specimen (L); mean of labral setae per specimen (LS); length-width ratio (L/W); mean of sample (M); range of data (R); standard deviation of sample (SD); number of segments (Seg); stipital setae of gnathochilarium (SS); greatest width of specimen (W). Neither the confidence limits of the mean nor the standard deviation was calculated for the females of *deses deses* because of inadequate material.

MALES									
	M		R		CLM		SD		
	A	B	A	B	A	B	A	B	
L	53.5	60.0	44-64	47-68	49.1-57.9	56.8-63.2	1.96	1.52	
W	5.7	6.7	4.0-6.6	5.8-7.4	4.5-6.9	5.7-7.7	0.565	0.455	
L/W	9.5	9.0	8.5-11.0	7.6-10.3	9.0-10.0	8.6-9.4	0.277	0.171	
Seg	46.0	47.5	42-51	42-51	44.8-47.2	46.6-48.4	0.57	0.44	
E/P	30.0	38.0	28-36	29-53	28.0-32.0	36.4-39.6	0.97	0.82	
CS	9.5	9.6	8-11	8-12	8.8-10.2	9.0-10.2	0.312	0.282	
LS	13.5	14.8	12-15	12-18	12.5-14.5	14.1-15.5	0.453	0.340	
SS	13.1	14.6	10-16	12-17	12.0-14.2	13.6-15.6	0.48	0.46	
FEMALES									
L	69.0	77.5	67-70	65-90		73.5-81.5		1.86	
W	8.27	8.55	8.0-8.6	7.0-10.0		8.12-8.98		0.202	
L/W	8.33	9.1	8.1-8.5	8.2-10.2		8.8-9.4		0.15	
Seg	45.0	47.0	44-46	44-51		46.1-47.9		0.44	
E/P	33.5	35.7	32-35	30-41		34.7-36.7		0.485	
CS	9.3	9.4	8-11	8-12		8.9-9.9		0.257	
LS	13.3	13.9	13-14	12-16		13.2-14.6		0.327	
SS	14.3	16.0	12-18	10-23		14.0-18.0		0.92	

Holotype male: 2 mi. W Cordelia, Solano County, California, 25 November 1964 (J. S. Buckett), deposited in the Entomology Collection, Department of Entomology and Acarology, University of California, Davis, California. One paratype (designated allotype), data same as holotype, deposited in the collection of the authors. Additional paratypes deposited in the following institutions or collections: Buckett-Gardner Collection, Davis, California; California Academy of Sciences, San Francisco; N. B. Causey Collection, Baton Rouge, Louisiana; R. L. Hoffman Collection, Radford, Virginia; W. T. Keeton Collection, Cornell University, Ithaca, New York; H. F. Loomis Collection, Miami, Florida; United States National Museum, Washington, D. C. Total number of specimens examined was 34, 33 of which are designated paratypes. Specimens examined: 4 males, 4 females, 2 mi. W Cordelia, Solano County, California, 25 November 1964 (J.S.B.); 8 males, 9 females, 2 mi. W Cordelia, Solano County, 21 December 1964 (J.S.B. and M. R. Gardner); 7 males, 2 females, 3.6 mi. SW Cordelia, Solano County, 27 November 1964 (J.S.B. and W. R. Bauer).

T. deses magnificus can readily be distinguished from the nominate *deses* by its conspicuously larger size; coloration is generally similar except for the broader red annulus on the posterior portion of each segment (giving a bicolored effect in light colored females). Other characteristics are enumerated in Table 1.

The habitat in which *magnificus* occurs is, in general, very similar to that in which the nominate *deses* occurs. The only obvious geographical boundary that might account for isolation of *magnificus* is the drainage of both the Napa and Sonoma rivers, which have wide valleys throughout their latter portions. *T. deses* is confined to woodland, unlike, for example, *T. uncigerus* Wood, which inhabits both woodland and the grassland areas far from woodland. There is not a continuous woodland from Cordelia to Petaluma, unless one goes to the north of the aforementioned valleys, in which case the soil changes radically (to serpentine) in areas, and the flora also undergoes change from lower Sonoran to upper Sonoran and Transition zones. Attempts to collect specimens of *deses* between the two populations have failed.

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